

PATENT SPECIFICATION

NO DRAWINGS

863,287



Date of Application and filing Complete Specification:
November 27, 1958.

No. 38322/58.

Application made in United States of America on
December 13, 1957.

Complete Specification Published March 22, 1961.

Index at Acceptance: Class 130, C2, I(2:10).

International Classification: A24b,d.

Smoking Tobacco Product.

COMPLETE SPECIFICATION

We, P. LORILLARD COMPANY, a corporation organized and existing under the laws of the State of New Jersey, United States of America, located at 200 East 42nd Street, New York 17, New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to smoking tobacco products and has particular reference to methods of imparting to tobacco the property of rendering inactive those components in tobacco smoke which are considered to be harmful to the consumer, and the invention further relates to products having that property.

It is known that when tobacco is smoked in any form, whether in a cigarette or pipe or as a cigar, incomplete combustion products are formed which are generally known as tar. Such tar is an extremely complex mixture of a great number of organic compounds, including nicotine, some of which are aromatic and fragrant and thus contribute to the pleasure of smoking, whereas others are, to various degrees, irritating to the sensitive tissues of the respiratory tract. Included in the latter group are the polycyclic or polynuclear hydrocarbons, which though occurring in very small concentrations, can be detected in tobacco smoke condensate, and it has been contended that such hydrocarbons contribute to the incidence of carcinogenic conditions sometimes found in the respiratory tract of tobacco smokers.

Considering that the polycyclic or polynuclear hydrocarbon compounds or other distillation complexes resulting from the combustion of the tobacco are harmful to the respiratory tissues of the smoker in a degenerative or destructive sense, the removal, or modification to a harmless degree, of such compounds is highly desirable, especially when such removal or modification is unaccompanied by noticeable impairment of the flavour or aroma of the tobacco.

In as much as the distillation zone in a burning tobacco article, such as a lighted cigarette, occurs immediately behind the glow or combustion point which has a maximum temperature of about 880°C. during a "draw" thermal cracking of the hydrocarbon compounds takes place at that temperature, thereby resulting in the production of many complex compounds which are additional to the straight oxidation and distillation products, and which may contribute to the deleterious and irritating properties of the smoke reaching the smoker. Furthermore, inasmuch as the distillation and thermal cracking products soon reach cooler zones in the cigarette, some of them condense on the unconsumed tobacco flakes or shreds, with the result that further distillation and thermal cracking of the condensed products along with the theretofore undistilled and uncracked products takes place in a manner which is not static, but is transitory and progressive as the smoking process continues, so that the distillation and cracking and condensation is repeated again and again until the whole length of the cigarette is consumed. Accordingly, the so-called tar collected from a burning tobacco article, such as a cigarette, is not a simple product of true combustion or oxidation but, on the contrary, is a mixture of straight combustion and distillation products in admixture with thermally cracked products of progressive multiple distillation and thermal cracking steps.

In accordance with the present invention tobacco is treated to modify the volatile components thereof which are released during the smoking process, by a method including adding to the tobacco calcium oxide or a compound which is converted into calcium oxide at the temperature of a combustion of

(Price 3s. 6d.)

Price 330

the tobacco. Preferably iron oxide is also added to the tobacco.

In this way the potentially harmful hydrocarbon distillation and thermal cracking products are so modified, or changed to a degree amounting to at least partial removal, that the undesirable effects of the smoke drawn into the respiratory tract of the smoker are minimised and in most instances eliminated, depending upon the degree of sensitivity of the smoker to such products, all without noticeable impairment of the flavour or aroma of the tobacco.

A further accomplishment of the invention is a reduction in total tar which, in turn, creates a smoother and lighter smoke, with again no impairment of flavour or aroma.

The additive is incorporated in the tobacco before it is incorporated in or formed into a tobacco article, such as a cigarette. When the tobacco reaches the high combustion temperature the additive adds to the thermal cracking what is believed to be destructive catalytic cracking and thus causes or induces the hydrocarbon distillation and thermal cracking products to be decreased so that such products no longer have their original physiological properties, particularly the polycyclic or polynuclear hydrocarbon compounds considered to be harmful to the smoker. Inasmuch as the supposed catalyst or catalytic agent is distributed throughout the length of the smoked article, i.e., between the combustion zone and the lips of the smoker, the complex products resulting from the combustion of condensed prior distillation products and the unconsumed tobacco are progressively treated in the presence of the supposed catalyst or catalytic agent as the smoking process continues.

In a preferred mode of carrying out the methods of making the tobacco article of this invention, the tobacco is coated or impregnated with the agent or the latter is otherwise incorporated in or with tobacco, either by (1) coating the moist tobacco flakes or shreds with the agent in solid finely divided form, or by (2) coating or impregnating the tobacco flakes or shreds with the agent applied in the form of a true solution, or by (3) coating or impregnating the tobacco flakes or shreds with the agent applied in the form of a colloidal solution or slurry, or by (4) applying compounds of the agent to the tobacco in such form that the heat of combustion of the tobacco converts such compounds into the desired agent in situ.

Calcium oxide, suitable compounds which are converted into calcium oxide on heating and a mixture of calcium oxide and iron oxide have the property of causing the harmful products to be oxidised at the temperatures of combustion of the tobacco. They are also particularly

suitable in that they are not toxic, poisonous, or such as to form toxic products at the temperatures readed in the burning of the tobacco. The chosen additive comprising either calcium oxide or a compound which is converted into calcium oxide at the temperature of combustion of the tobacco can be applied to the tobacco while in natural leaf form or flakes or shreads thereof, or reconstituted tobacco sheets, flakes or shreds, by moistening the tobacco with clear water with a small percentage of glucose or the like to render the tobacco tacky, and then dusting the moist tobacco with the agent in finely-divided form such as in impalpable powder form. In this way, upon drying, practically every unit of area of the tobacco leaf, sheet, flake or shred is coated with the agent. Alternatively, the finely-divided agent is finely sprayed on the tobacco as a slurry suspension in clear water, a mixture of water and glycerine or glucose, water and a colloidal stabilizer or combinations thereof, so that the tobacco is coated with the agent upon drying in the manner described, and due to the fineness of the powder, it penetrates to a degree into the tobacco. Concentrations ranging from 0.5 to 5% by dry weight have been found to be satisfactory although, because of the inert-to-human membrane nature of the agents, larger percentages may be employed e.g., up to 10% by dry weight, without noticeable objectionable results, although also without noticeably increased advantage. The thus-impregnated tobacco upon drying may be formed into cigarettes, cigars or smoking tobacco. The impregnant accordingly remains inert as the organic salt until the tobacco containing it is burned in the smoking process, whereupon the metallic oxide, performs its catalytic tar cracking function in the manner described.

It will be seen that the novel method of this invention of imparting to tobacco the property of decreasing the amount of tar and rendering inactive or inert to the respiratory tract those harmful compounds resulting from the combustion of the tobacco in the smoking process, and the resulting product, not only renders the tobacco smoking more desirable but makes the use of separate filters unnecessary, without noticeably impairing the flavour and aroma of the tobacco smoke.

We are aware of the Customs and Excise Act 1952, 15 and 16 Ges 6 and 1 Eliz Chapter 44 and we make no claim to use the invention in contravention of any of the provisions of that act.

WHAT WE CLAIM IS:

1. A method of treating tobacco to modify the volatile components thereof which are released during the smoking process, including adding to the tobacco calcium

- oxide or a compound which is converted into calcium oxide at the temperature of combustion of the tobacco.
2. A method according to Claim 1 in which iron oxide is also added to the tobacco.
3. A method according to Claim 1 or 2 in which the tobacco is coated with the additive in a finely divided solid form.
- 10 4. A method according to Claim 3 in which the additive is applied when dry to moistened tobacco.
5. A method according to Claim 4 in which the treated tobacco is dried so as to leave it coated with the additive.
- 15 6. A method according to any one of the preceding claims in which the amount of additive applied to the tobacco does not exceed 10% of the dry weight of the tobacco.
- 20 7. A tobacco product including calcium oxide or a compound which is converted into calcium oxide at the temperature of combustion of the tobacco.
8. A tobacco product according to Claim 7 and also including iron oxide.
9. A method of treating tobacco substantially as herein described.

For the Applicants:

GILL, JENNINGS & EVERY,
Chartered Patent Agents,
51-52 Chancery Lane,
LONDON, W.C.2.

Sheerness: Printed for Her Majesty's Stationary Office, by Smiths, Printers and Duplicators.—1961.
Published at the Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.